

What is claimed is:

1. A dual-channel passband filtering device comprising:  
a first port;  
5 a second port; and  
a third port, wherein at least one first passband filter is connected between the first port and the second port, and at least one second passband filter is connected between the second port and the third port via a phase shifter, and wherein each of the first and second passband filters comprises:  
10 a first filter end having a first terminal and a second terminal;  
a second filter end having a third terminal and a fourth terminal;  
at least two series elements including a first and a second series element; and  
at least two shunt elements including a first and a second shunt element, wherein  
the first series element having a first end connected to the first terminal and a  
15 second end connected to the third terminal;  
the second series element having a first end connected to the second terminal and a second end connected to the fourth terminal;  
the first shunt element having a first end connected to the first terminal and a second end connected to the fourth terminal; and  
20 the second shunt element having a first end connected to the second terminal and a second end connected to the third terminal, and wherein each of the series and shunt elements includes an acoustic resonator.
2. The dual-channel passband filtering device of claim 1, wherein the first passband  
25 filter has a first passband frequency and the second passband filter has a second passband frequency different from the first passband frequency.
3. The dual-channel passband filtering device of claim 1, wherein the first passband  
30 filter has a first passband frequency and the second passband filter has a second passband frequency and wherein the first and second passband frequencies are closely spaced in a frequency domain.

4. The dual-channel passband filtering device of claim 1, wherein the acoustic resonators are bulk acoustic wave devices.
5. The dual-channel passband filtering system of claim 1, wherein at least one of the acoustic resonators is a bridge-type bulk acoustic wave device.
6. The dual-channel passband filtering system of claim 1, wherein at least one of the acoustic resonators is a mirror-type bulk acoustic wave device.
7. The dual-channel passband filtering system of claim 1, wherein the acoustic resonators are thin-film bulk acoustic resonators.
8. The dual-channel passband filtering system of claim 1, wherein the acoustic resonators are surface acoustic wave devices.
9. The dual-channel passband filtering system of claim 1, further comprising a balun connected to the second port for receiving a single-ended antenna.
10. The dual-channel passband filtering system of claim 1, further comprising a balun connected to the first port for providing a single-ended port for use in conjunction with a single-ended transceiver.
11. The dual-channel passband filtering system of claim 1, further comprising a balun connected to the third port for providing a single-ended port for use in conjunction with a single-ended transceiver.
12. A front-end arrangement for use in a telecommunication device, comprising:  
an antenna port connected to an antenna system;  
a first port capable of conveying signals between a first transceiver connected to the first port and the antenna system via the antenna port; and  
a second port capable of conveying signals between a second transceiver connected to the second port and the antenna system via the antenna port, wherein at least

one first passband filter is connected between the first port and the antenna port for filtering the signals conveyed between the first transceiver and the antenna system, and at least one second passband filter is connected between the second port and the antenna port via a phase shifter for filtering the signals conveyed between the second transceiver and the antenna system, and wherein each of the first and second passband filters comprises:

a first filter end having a first terminal and a second terminal;  
a second filter end having a third terminal and a fourth terminal;  
at least two series elements including a first and a second series element; and  
at least two shunt elements including a first and a second shunt element, wherein the first series element having a first end connected to the first terminal and a second end connected to the third terminal;  
the second series element having a first end connected to the second terminal and a second end connected to the fourth terminal;  
the first shunt element having a first end connected to the first terminal and a second end connected to the fourth terminal; and  
the second shunt element having a first end connected to the second terminal and a second end connected to the third terminal, and wherein each of the series and shunt elements includes an acoustic resonator.

13. The front-end arrangement of claim 12, wherein the antenna port has a first port end and a second port end, and wherein the antenna system has a first antenna connected to the first port end, and a second antenna connected to the second port end.

14. The front-end arrangement of claim 12, wherein the antenna system comprises an antenna connected to the antenna port via a balun.

15. The front-end arrangement of claim 12, wherein the first transceiver is a transmitter and the second transceiver is a receiver.

16. The front-end arrangement of claim 12, wherein the first transceiver is a receiver and the second transceiver is a transmitter.

17. The front-end arrangement of claim 12, wherein both the first and the second transceivers are receivers.

5 18. The front-end arrangement of claim 12, wherein the first transceiver is connected to the first port via a balun.

19. The front-end arrangement of claim 12, wherein the second transceiver is connected to the second port via a balun.

10 20. The front-end arrangement of claim 12, wherein the first passband filter has a first passband frequency and the second passband filter has a second passband frequency different from the first passband frequency.

15 21. The front-end arrangement of claim 12, wherein the first passband filter has a first passband frequency and the second passband filter has a second passband frequency, and wherein the first and second passband frequencies are closely spaced in a frequency domain.

20 22. The front-end arrangement of claim 12, wherein the telecommunication device is a mobile phone.

23. The front-end arrangement of claim 12, wherein the telecommunication device is operated in a code-division multiple access mode.

25 24. The front-end arrangement of claim 12, wherein the telecommunication device is operated in a wideband code-division multiple access mode.

30 25. The front-end arrangement of claim 12, wherein the first transceiver is a receiver and the first passband filter has a first passband frequency substantially in the range of 1805 MHz - 1880 MHz, and wherein the second transceiver is a receiver and the second

passband filter has a second passband frequency substantially in the range of 1930 MHz - 1990 MHz.

26. The front-end arrangement of claim 12, wherein the first transceiver is a transmitter and the first passband filter has a first passband frequency substantially in the range of 1710 MHz-1785 MHz, and wherein the second transceiver is a receiver and the second passband filter has a second passband frequency substantially in the range of 1805 MHz - 1880 MHz.

27. The front-end arrangement of claim 12, wherein the first transceiver is a transmitter and the first passband filter has a first passband frequency substantially in the range of 1850 MHz-1910 MHz, and wherein the second transceiver is a receiver and the second passband filter has a second passband frequency substantially in the range of 1930 MHz - 1990 MHz.

28. The front-end arrangement of claim 12, wherein the acoustic resonators are bulk acoustic wave devices.

29. The front-end arrangement of claim 12, wherein at least one of the acoustic resonators is a bridge-type bulk acoustic wave device.

30. The front-end arrangement of claim 12, wherein at least one of the acoustic resonators is a mirror-type bulk acoustic wave device.

31. The front-end arrangement of claim 12, wherein the acoustic resonators are thin-film bulk acoustic resonators.

32. The front-end arrangement of claim 12, wherein the acoustic resonators are surface acoustic wave devices.